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Forest Service Handbook 7309.11 – Buildings and Related Facilities Handbook
Chapter 80 - Communication Sites and Related Facilities

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Approved by: Glenn P. Casamassa, Associate Deputy Chief, NFS

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Responsible Staff:

Explanation of changes: Following is an explanation of the changes throughout the directive by section.

80: Establishes chapter and sets forth codes, captions, and direction for communication sites and related facilities.

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This chapter does not apply to the occupancy and use of National Forest System lands for privately owned communication facilities. Privately owned communication facilities must be authorized by a special use authorization, see FSM 2700 and FSH 2709.11, chapter 10 and chapter 90 for further direction.

80.2 - Objective

To provide safe, functionally efficient, aesthetically pleasing, energy efficient, and cost effective communication sites and related facilities that are owned, operated, occupied, or authorized for use by the Forest Service and are required to conduct activities authorized by the Forest Service.

80.3 - Policy

1. All communication sites must be planned to meet the requirements of FSH 7309.11, chapter 20 and section 81 of this chapter. Communication sites must be planned with the Chief Information Officer (CIO) and other applicable program areas.

2. All communication site facilities must be developed in compliance with FSH 7309.11, chapter 30 and section 82 of this chapter.

3. All communication site facilities must be managed in compliance with FSH 7309.11, chapter 40, chapter 60, chapter 70, and section 83 of this chapter.

4. All CIO personnel climbing towers shall meet certifications identified in the CIO fall protection plan. All personnel climbing towers for inspections shall meet certifications identified in section 83.2 of this chapter, as applicable.

80.4 - Responsibility

80.41 - Washington Office, Director of Engineering

The Washington Office, Director of Engineering is responsible for:

1. Developing, issuing, reviewing, and monitoring engineering directives, including standards and criteria.

2. Providing programmatic oversight such as establishing business requirements, making decisions for database needs, overseeing agreements, and other general program management as it pertains to communication sites.

80.42 - Washington Office, Chief Information Officer

The Washington Office, Chief Information Officer (CIO) is responsible for:

1. Developing, issuing, reviewing, and monitoring CIO directives, including standards and criteria.

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2. Providing programmatic oversight such as establishing business requirements, making decisions for database needs, overseeing agreements, and other general program management as it pertains to communication sites.

3. Existing Installations:

a. Documenting any infrastructure health and safety maintenance deficiencies noted during communication sites monitoring and providing notification of the deficiencies to the local Unit for appropriate action.

b. Ensuring compliance with industry standards for installation and maintenance actions of communication equipment and ancillary equipment.

c. Filing plans, calculations, specifications, and other documents. Providing documents to the Unit to maintain.

d. Developing initial database asset information in the system of record.

4. New Construction:

a. Providing recommendations for site selection, as well as development for communication sites and other associated infrastructure.

b. Providing sufficient information for communication system design, radio frequency propagation, site planning, calculations, specifications, related data, and certifications.

c. Ensuring compliance of the procedures for acceptance during the initial inspection and monitoring inspections.

d. Filing plans, calculations, specifications, and other documents. Providing documents to the Unit to maintain.

e. Providing technical assistance for preliminary analysis prior to design, including but not limited to, facility master planning, site development planning, National Environmental Policy Act requirements, preliminary project analysis, and value analysis.

f. Providing location of communication needs.

g. Providing personnel that are technically qualified to administer the overall service, and supplying a turn-key contract for communication sites.

h. Providing personnel that are technically qualified to administer the communications equipment installation at communication sites.

i. Developing initial database asset information in the system of record.

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5. Modifications:

a. Providing recommendations for site modifications and development for communication sites and other associated buildings.

b. Providing information for modifications of communication system design, radio frequency propagation, site planning, calculations, specifications, related data, and certifications.

c. Ensuring compliance of the procedures for acceptance during the initial inspection of modifications.

d. Filing modification plans, calculations, specifications, and other documents. Providing updated documents to the Unit to maintain.

e. Providing technical assistance for analysis of proposed modifications prior to design, including but not limited to, facility master planning, site development planning, National Environmental Policy Act requirements, preliminary project analysis, and value analysis.

f. Providing personnel that are technically qualified to administer the overall service and supplying a turn-key contract for communication sites.

g. Providing personnel that are technically qualified to administer the communications equipment installation at communication sites.

6. Operations and Maintenance: Operating, maintaining, and inspecting telecommunication equipment and associated radio and ancillary equipment located on communication sites.

80.43 - Regional Foresters, Station Directors, and the Area Director

Regional Foresters, Station Directors, and the Area Director are responsible for:

1. Providing direction, consultation, assistance, technology transfer, and training to the Forests and Districts for all aspects of communication sites.

2. Reviewing and shall provide approval of site development plans, building layouts, and all construction proposals for communication sites to be located on Forest Service lands. In accordance with FSM 7310.42, paragraph 3, the technical responsibility for review and approval for these facilities may be re-delegated to the Regional Director of Engineering.

80.44 - Regional Director of Engineering, Station Engineers, and Area Engineers

Regional Directors of Engineering, Station Engineers, and Area Engineers are responsible for:

1. Existing Installations:

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a. Maintaining an inventory of communication sites constructed features.

b. Monitoring structural inspections to ensure that inspection reports are adequate and accurate. This does not include telecommunications equipment and associated radio and ancillary equipment.

c. Ensuring corrective action plans are developed for non-health and safety deficiencies noted during communication site inspections.

d. Ensuring corrective actions performed for health and safety deficiencies noted during communication site inspections.

e. Reviewing proposed design for communication sites and technical proposals.

2. New Construction:

a. Reviewing technical approval of site development plans, building designs, and all construction proposals for communication sites to be located on Forest Service lands. As delegated by the Regional Forester, the Regional Director of Engineering may approve site development plans, building designs, and all construction proposals for communication sites to be located on Forest Service lands.

b. Reviewing site selection and development for communication sites and other associated buildings.

c. Reviewing the sufficiency of required plans, calculations, specifications, and related data, and certifications, including certification by the qualified engineer that the communication sites meet all applicable standards in section 82.

d. Ensuring compliance of the procedures for acceptance during the initial inspection and monitoring inspections.

e. Filing plans, calculations, specifications, and other documents.

3. Modifications:

a. Reviewing technical approval of site modifications, building modification designs, and all modification proposals for communication sites to be located on Forest Service lands.

b. Reviewing site modifications for communication sites and other associated buildings.

c. Reviewing the sufficiency of required modification plans, calculations, specifications, and related data. Providing updated documents to the Unit to maintain.

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d. Ensuring compliance of the procedures for acceptance during the initial inspection of modifications.

e. Reviewing sufficiency of design parameters for modifications provided by the Unit.

f. Filing modification plans, calculations, specifications, and other documents in accordance with Regional practice.

80.45 - Forest Supervisors, Research Project Leaders, and Area Supervisors

Forest Supervisors, Research Project Leaders, and Area Supervisors (Units) are responsible for:

1. Existing Installations:

   a. Maintaining data in the system of record.

   b. Maintaining data files at the Unit level.

   c. Developing corrective action plans for non-health and safety deficiencies noted during communication site inspections.

   d. Performing corrective actions for health and safety deficiencies noted during communication site inspections.

2. New Construction:

   a. Identifying communication needs.

   b. Completing all preliminary analysis prior to design, including but not limited to, facility master planning, site development planning, National Environmental Policy Act requirements, preliminary project analysis, and value analysis.

   c. Providing design parameters that may include, but are not limited to, wind load, snow load, geotechnical data, topographical information, classification selection, exposure category, site class definition, and communication system requirements.

   d. Providing personnel that are technically qualified to administer communication site construction contracts.

   e. Maintaining data in the system of record.

   f. Maintaining data files at the Unit level.

3. Modifications:

   a. Completing all preliminary analysis prior to modification design, including but not limited to, facility master planning, site development planning, National

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Environmental Policy Act requirements, preliminary project analysis, and value analysis.

b. Providing modification design parameters that may include, but not limited to, wind load, snow load, geotechnical data, topographical information, classification selection, exposure category, site class definition, and communication system requirements.

c. Providing personnel that are technically qualified to administer communication site construction contracts for modifications.

d. Maintaining modification data in the system of record.

e. Maintaining modification data files at the Unit level.

4. Operation and Maintenance: Operating, maintaining, and inspecting real property infrastructure and related facilities on communication sites. Critical health and safety findings must be reported to the Forest Supervisor within 24 hours. The Forest Supervisor shall determine if the facilities must be closed.

80.5 - Definitions

Ancillary Equipment. Parts and material used to connect radio equipment or items necessary to support the functionality of the system as a whole. Typically includes radio frequency (RF) feed line cables, RF antennas, DC power components, solar components (NOT generators), batteries, surge suppression, grounding material, RF filtering, and any other equipment needed for the communication system to function properly. Typically ends at the point where the radio infrastructure ties into the building (that is, AC power plugs, building ground system, and so forth).

Certified Building Inspector. Meets the criteria outlined in FSH 7309.11, chapter 40, section 44 and section 83.2 of this chapter.

Certified Climber. Forest Service personnel climbing towers shall meet certifications identified in section 83.23 of this chapter

Certified Tower Inspector. Designated in writing from Regional Director of Engineering as outlined in section 83.2 of this chapter

Communication Cabinet/Enclosure. The cabinet/enclosure site type is designed and built exclusively to house telecommunications equipment and any supporting equipment. It is not designed for the technician to enter. Cabinets/enclosures can be located indoors or outdoors, and they may be placed on a small foundation or wall/pole mounted.

Communication Shelter. Refers to a structure designed and built to protect telecommunications equipment. Shelters are intended to be safely occupied by personnel during equipment installation, inspection, and maintenance.

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Communication Sites. A site established, designated, and operated to provide telecommunications for Forest Service administrative use. A communications site is designated for telecommunications use. A communication site may include, but is not limited to, telecommunication tower(s), shelter building(s), telecommunication equipment, helipad, power systems, fuel systems, platforms, and elevated walkways.

Communication Room. The room is designed and built exclusively to house telecommunications equipment and any supporting equipment. This room is typically located in a building. Rooms are intended to be safely occupied by personnel during equipment installation, inspection and maintenance.

Constructed features include, but are not limited to, telecommunication towers, shelter buildings, helipads, primary power generating and distribution systems, fuel systems, platforms, and elevated walkways. Constructed features include designed buildings and structures, whether manufactured, prefabricated, modular, or site built. For the purpose of this section, constructed features exclude telecommunications equipment installed within or attached to constructed features. Mounting hardware, and fastening or connection of telecommunications equipment to constructed features, may be included.

Lightning Protection Systems. A system designed to protect a structure and telecommunications equipment from damage due to lightning strikes, by intercepting such strikes and safely passing their extremely high currents to ground. A lightning protection system includes a network of air terminals, bonding conductors, and ground electrodes designed to provide a low impedance path to ground for potential strikes.

Permanent Tower Record. A complete history of a tower structure maintained on each Forest where the tower is located. At minimum, the record must contain procurement documents including: design drawings, specifications, and calculations; manufacturer/fabricator name and contact information; model, serial number, and date of fabrication (if applicable); erection manual/instructions; all inspection reports; all maintenance and repair records; and all documents related to modifications to the tower, including addition or removal of accessories. The permanent tower record must be maintained in a format that allows access by those needing to reference information while maintaining record integrity.

Power System. A source that provides power to the telecommunications equipment. Power may be derived from an AC source through commercial power or generation. Power may be derived from a DC source through a battery bank charged from photovoltaic system, generator (propane, diesel, wind, thermoelectric, and so forth), or commercial power grid.

Qualified Engineer. A qualified engineer is one who by experience, education, or license is technically trained and experienced to perform the engineering tasks specified, and is designated by the Washington Office, Director of Engineering, which may be delegated to the Regional Directors of Engineering.

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Radio Equipment (Electronics equipment). Radio equipment located at a specific site that supports the use of user or portable radio equipment (mobile and handheld).

Telecommunication Tower. A principal structure that is designed specifically to support telecommunication equipment. Fire lookout towers and other structures are not specifically designed to support telecommunications equipment. Fire lookout towers are not telecommunication towers and must be managed through their principal use of this chapter, supplementing as appropriate.

Telecommunication. Communication at a distance by technological means, particularly through electrical signals or electromagnetic waves. Due to the many different technologies involved, the word is often used in a plural form, as telecommunications (FSM 6640).

81 - Planning

All communication sites must meet the requirements of FSH 7309.11, chapter 20. Communication sites must be planned with the CIO and other applicable program areas. The planning process should take into consideration alternative technologies, such as, but not limited to, Radio over Internet Protocol (RoIP) and shared resources across neighboring Regions, Forests, agencies, or private entities. The planning process should include but not be limited to, cost efficiency, risk assessment, and sustainability.

In addition to the requirements in FSH 7309.11, chapter 20, identify specific needs for communication sites including radio frequency, wind loads, and a geotechnical investigation. CIO resources used during general planning should include a radio frequency coverage map and a radio system design.

When communication facilities as defined in this chapter are located within a designated communications site as defined in FSH 2709.11, chapter 90, they must comply with the requirements included in the communications site management plan. The communication site management plan is prepared by the Special Uses staff in consultation with other program areas and site users.

82 - Development of Constructed Features

All communication site constructed features must be developed to ensure compliance with FSH 7309.11, chapter 30.

82.1 - Designs, Plans, Construction Specifications, and Cost Estimates

Designs, plans, construction specifications, and cost estimates for communication sites must meet the following requirements:

1. All construction, modifications, or repair work must have an approved design, stamped and signed by a professional engineer licensed in the State where the site is located.

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2. Designs, plans, and specifications prepared by contractors, consultants, product manufacturers, volunteers, other agencies, or others must have an approved design, stamped and signed by a professional engineer licensed in the State where the site is located.

3. Designs for communication sites must be based on sufficient and accurate data, including appropriate site surveys and geotechnical investigations.

4. Design criteria for communication sites must address, but not be limited to, safety, resource management, land use, economics, esthetics, or other applicable criteria.

5. Designs, plans, and specifications for all communication sites must be reviewed and signed concurrently by the CIO and Regional Forester or designee.

6. A permanent file must be developed for each communication site. A permanent file should include site plans with drawings, design calculations, geotechnical and foundation investigation reports, and the Permanent Tower Record. The file must be maintained at a single location, typically the Forest Supervisor's office.

7. Electrical power systems must be designed in accordance with FSM 7610.

8. Lightning protection systems must be designed in accordance with FSM 7610.

9. If the building is occupied and in a location where more critical protection is required, such as a mountain top or similar hazard, the lightning protection system must be designed by a professional engineer, UL, or Lightning Protection Society certified designer.

82.2 - Tower Design

Only third parties (non-Forest Service) with qualified telecommunications tower design engineers are authorized to design telecommunications towers to industry standard. Modifications of designs must be approved by a responsible design engineer.

A new, reinstalled, or modified tower must be designed to the most current edition of the Telecommunications Industry Association (TIA) TIA-222, "Structural Standard for Antenna Supporting Structures and Antennas," and the following criteria:

1. Towers must be designed to a minimum of a Structure Class II and Wind Exposure C with the appropriate Topographic Category.

2. Towers located in High Wind and Ice Special Regions geographically identified in TIA-222 must consider more specific local site wind and ice data for a 50-year recurring interval. If more specific data is unavailable, the following must apply.

3. For wind only design condition, use a minimum of 120 MPH Three Second Wind Gust Speed.

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4. For wind with radial ice design condition, use a minimum of 60 MPH Three Second Wind Gust Speed with a minimum of 1 inch radial ice thickness adjusted for tower height. Radial ice must have a density of 56 PCF.

5. Foundations must be designed to soil and rock engineering criteria recommended by a geotechnical engineer.

Towers must incorporate seismic design criteria in the geotechnical investigation and structural design as appropriate.

Communication sites must incorporate appropriate snow loads for enclosures, guy wires, and lower tower members as appropriate.

82.3 - Design Standards

Design engineers should use the most current version or edition of the standards listed below.

1. ANSI/NFPA 70 National Electrical Code (NEC).

2. ANSI/NFPA 780 Standard for the Installation of Lightning Protection Systems.

3. ANSI/TIA/EIA 222 Structural Standards for Steel Antenna Towers and Supporting Structures Federal Communications Commission Office of Engineering and Technology (FCC) OET Bulletin 65, Edition 97-01: Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields.

4. FAA Advisory Circular #AC 70/7460 - Obstruction Marking and Lighting.

5. Local or State building codes may apply.

6. Occupational Safety and Health Administration - Occupation Safety laws.

83 - Management

All communication site facilities must be managed to ensure compliance with FSH 7309.11, chapter 40, chapter 60, and chapter 70.

83.1 - Site and Tower Inspections

83.11 - General

Communication Site Inspections are inspections of telecommunications equipment and constructed features associated with initiating and maintaining fully functional communications installations. The purpose of these inspections is to ensure safety for people working on and near the sites, as well as to enhance reliability and functionality of equipment and structures. Inspections may be specific to one structure or piece of equipment or multifaceted involving many site assets. Regardless of the reason for a Communications Site Inspection, findings of

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inspections should be recorded and retained for reference and monitoring purposes. Inspection activities must follow appropriate training in accordance with section 83.2.

83.12 - Telecommunications Equipment Inspections

Telecommunication equipment inspections are addressed in FSH 6609.14, Telecommunications Handbook.

83.13 - Inspection of Constructed Features

Inspection of constructed features must be conducted in accordance with applicable Forest Service-7000 series direction.

83.14 - Telecommunication Tower Inspection Policy and Procedures

Telecommunication Tower Inspections, including structural elements, accessory, and ancillary features (such as grounding, lighting, visual marking, and so forth) must be performed only by persons certified by a Regional Director of Engineering. Certified persons may be qualified Forest Service personnel or qualified contractor employees.

Designated tower inspectors shall have the knowledge, experience, and certifications necessary to plan, carry out, and record safe tower inspections with information contained in tower design and tower erection manuals for initial inspections, and in the Permanent Tower Record for subsequent inspections. Contracted work will be performed by the contractors' qualified personnel and overseen by Forest Service Contracting Officer's Representatives. All inspectors are expected to be familiar with specific design requirements for each tower to be inspected and any tools and equipment necessary to conduct the inspection, as well as all applicable laws, regulations, and industry standards (see section 82.3, Design Standards).

The following references are provided to help guide decision-makers and those who plan and order tower inspections. These are industry standards in copyrighted publications that are referenced elsewhere in this directive for specific policy and direction; they are referenced here as guidelines for how inspections may be performed:

1. ANSI/TIA 222.

2. Occupational Safety and Health Administration - Occupation Safety laws.

3. ANSI/NFPA 70 National Electrical Code (NEC).

83.15 - Telecommunication Tower Inspections

Telecommunication tower inspections (also referred to as condition assessments) are described specifically in this chapter. Tower inspections need to be timely, accurate, well documented and they need to identify follow-up actions. For the purpose of this direction, inspections are expected to be performed by trained, qualified, and, in some instances, certified persons. Tower inspections serve two integral functions:

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1. Health and safety of persons near or working on a tower, and

2. Determination and documentation of physical and functional conditions of the tower and appurtenances.

Reasons for conducting tower inspections are often reflected in the title such as “climb inspection,” “initial inspection,” “special inspection,” and so forth. There may be multiple reasons for conducting an inspection. Regardless of title, tower inspection reports should state the reasons an inspection was performed, as well as findings, observations, and recommendations.

83.16 - Types (Titles) of Tower Inspections

83.16a - Initial Acceptance/Commissioning

Initial inspection is the first inspection of a tower structure as it becomes part of a Communication Site. This inspection is intended to certify newly installed towers as acceptable for use, and initiate a permanent tower record. The certifying official shall review the following documents and sign and date a certificate of acceptance for each tower placed in service. The certificate of acceptance, signed and dated by the certifying official, along with supporting documents, shall initiate the Permanent Tower Record maintained by the Forest upon which the tower is located. Supporting documents include:

1. Tower design drawings, specifications.

2. Any modifications to the design.

3. Erection manual/instructions.

4. Procurement documents, including shop drawings and erection contract, if applicable.

5. Construction inspection diaries/photos, including but not limited to:

   a. Inventory and condition inspection.

   b. Special construction inspections and reports, such as concrete tests, guy tensioning and alignment reports, and so forth.

   c. Tower name plate data, including manufacturer /fabricator name, date, serial number, and model (if appropriate).

The certifying/accepting official shall determine the need and desirability for an independent on-site tower inspection. Such determination should be based on the size, complexity, and nature of the installation, as well as the adequacy of construction inspection.

For example: A new, 300-foot, guyed, skeletal steel tower with several attached microwave dishes that was inspected infrequently during erection, would likely warrant an independent

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initial inspection more than a 30-foot monopole tower designed as an integral feature of a communications shelter installed by a reputable, experienced contractor.

83.16b - Climbing Inspection

1. Pre-climb for visual inspection from the ground (may include optics such as binoculars). Report anything that looks out of the ordinary, and take photos. IF NOT SAFE, DON'T CLIMB! A pre-climb safety inspection is always performed immediately before mounting a tower by each climber. Pre-climb inspections are visual and intended to satisfy each climber that current condition of the constructed feature (tower), as well as other physical conditions such as weather, safety equipment, and so forth, will result in a safe climb. Pre-climb inspections must be documented, signed, and dated by each climber, and become a part of tower's permanent record. Pre-climb inspections that find unacceptable conditions could result in a special inspection and repair before an on-tower inspection is permitted.

2. Tower inspections are performed as a function of initial tower erection, any subsequent maintenance, and repairs to a tower or attachments that require a person to work above ground level on any part of a tower structure, including the guys. All tower climbers should be alert to anything that may adversely influence safety while on a tower, such as missing/deformed structural elements, loose/missing connectors, changing weather conditions, and safety equipment malfunction, regardless of the reason for the inspection. Conditions deemed unsafe should be documented; climbers should be evacuated from the tower; and appropriate safety and health steps should be taken to "red tag" the tower until corrective actions are complete, and unsafe conditions are abated. All red tag towers must be communicated to the Safety Officer, who will take appropriate measures as outlined in FSM 6700, Safety and Occupation Health Program.

83.16c - Routine (Periodic) Inspections

The frequency for routine inspections is 3 years for guyed towers, or 5 years for free-standing towers (see ANSI/TIA 222), unless noted otherwise in a Permanent Tower Record. Personnel performing these inspections shall have certifications from a National Association of Tower Erectors (NATE) course. These inspections are detailed, on tower, inspections that can be considered operational preventive maintenance in that they serve the purpose of documenting current condition, deficiencies, and discrepancies requiring remedial action, and monitoring condition of a tower over time. Routine inspections are intended to minimize emergency repairs or failures through early detection of damage and deterioration. Routine inspections are similar to initial inspections. A certified inspector studies a specific tower's design and history, then assesses the tower's condition based on the certified inspector's experience. The deliverable is a written report documenting the physical condition of the tower. Inspectors develop and employ their own inspection procedures based on individual tower characteristics. The Permanent Tower Record should be available to the inspector prior to all routine inspections. The inspector will make note of previously reported defects, such as deformed/corroded members, missing/loose connectors, misalignment, out of tolerance guy tensions, fading paint, extinguished warning lights, and so forth, in order to detect changes since the last inspection (including

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correction of defects since the last report). Routine inspection reports must become part of each tower's permanent record.

83.16d - Modification/Addition/Repair Inspections

These inspections are performed whenever there is a modification to a tower structure; new telecommunications equipment is attached to, removed from, or relocated on a tower; or structural repairs are made. The process and procedures must be similar to fabrication, erection/ installation, and initial inspections depending on the extent of modifications and additions. The need for and extent of inspection must be determined by the authority ordering the work (Forest Supervisor) and must be documented in the Permanent Tower Record. All modifications, additions, and repairs must be recorded, no matter how minor.

83.16e - Special and Emergency Inspections

Special and Emergency inspections are conducted whenever a tower is subjected to unusual conditions, such as high winds, dust storms, floods, lightning strikes, impacts, and earthquakes, which could result in actual or suspected damage affecting the tower's structural or functional integrity.

Such deficiencies are typically noted in periodic inspection reports as "Trends to Monitor". Examples of deficiencies warranting special inspections include deformed structural elements, corrosion/rust, fading or failing coatings, changes in tower alignment, and guy tensions. Special and emergency inspections are scheduled at the discretion of the Forest Service, and are used to monitor specific known or suspected deficiencies.

83.16f - Failure/Forensic Inspections

Failure/Forensic inspections are performed to determine cause(s) of failure so that future failures can be minimized and/or mitigated. These inspections are often the most difficult and comprehensive, and as such, must be performed by highly qualified inspectors.

83.2 - Certifications and Training for Inspectors

83.21 - General Training

In accordance with 29 CFR 1910, 29 CFR 1926, 29 CFR 1960, Forest Service Handbook (FSH) 6709.11 Health and Safety Code Handbook, and Executive Order (EO) 12196 ("Occupational Safety and Health Programs for Federal Employees"), and subsequent Executive Orders issued pursuant to Section 19 of the Act or Sections 7901, 7902, and 7903 of Title 5 of the United States Code (U.S.C.), and where specifically incorporated by reference in the applicable OSHA standards, the ANSI Z359 Fall Protection Code. Where ANSI/ASSE code is not incorporated by reference in the applicable OSHA standards and where feasible, as determined by the Program Administrator, ANSI/ASSE code may or may not be incorporated into this plan. All employees who perform tower work are required to meet the following criteria for inspection practice and maintenance.

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1. Inspection Practice (planning, documentation, and record keeping) criteria includes:

   a. Ability to review and understand record documents (as-builts, prior inspection reports, and photos) and organize/plan for field work (what to carry in the field).

   b. Training in use of basic inspection tools.

   c. Training in use of specialized equipment for check of tower plumb (see also inspector maintenance below).

   d. Training in recognizing condition states of commonly assembled structure types using commonly recognized materials (for example, concrete, PT timber, steel, aluminum), which also involves defect identification and its extent and severity, along with noted location on structure.

   e. Training in Federal Aviation Agency (FAA) and Telecommunications Industry Association (TIA) standards for marking (paint) and lighting for inspection purposes.

   f. Training in report writing and notification for follow-up.

   g. Training in database entry of reporting results.

   h. Refresher training for structural inspection technique on agency-required schedule.

2. Inspector Maintenance criteria includes the ability to perform:

   a. General cleaning and limited debris/obstruction removal.

   b. Re-tightening of loose fasteners (bearing-type connections).

   c. Replacement of any critical warning signs or devices.

   d. General maintenance for lighting (temporary and permanent) and FAA-required marking.

   e. Specialized maintenance.

   f. Guy wire re-tensioning (using dynamometer) in conjunction with tower plumb (use of survey equipment).

Certifications can be revoked if the inspector displays poor performance or does not have adequate training.

83.22 - Complex Building Inspection Certifications

Personnel performing building inspections must meet the complex building certifications as defined in FSH 7309.11, chapter 40, section 44.

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83.23 - Climbing Certifications

Personnel who will climb towers must:

1. Be certified under the Fall Protection Code (ANSI Z359) as a Competent Person and as a Competent Rescuer.

2. Demonstrate to Regional Engineer full understanding and confidence in the use of these requisite skills.

83.24 - Grounding Inspection Certifications

Personnel performing grounding inspections shall be a qualified engineer who has acquired the types of equipment needed and have requisite knowledge of use with skills to interpret the results through study, training, and experience. Licensed electricians or technicians working under the supervision of a qualified engineer are allowed.

83.25 - Lightning Protection System Inspection Certifications

1. Inspections must be made by a qualified engineer familiar with lightning protection design, installation, and NFPA 780.

2. Technicians or licensed electricians working under the supervision of a qualified engineer are allowed.

3. Nationally Recognized Testing Laboratory (NRTL) lightning protection inspectors and professional organizations such as the Lightning Protection Institute (LPI) licensed installers are allowed as qualified inspectors.

83.3 - Records and Reports

All communication sites records and reports must be managed in accordance to FSH 7309.11, chapters 60 and section 80.5 for permanent tower records.

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